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1 **ASBSTRACT**

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3 A structure (i.e. a segmented grating) which applies a designated complex-valued
4 spectral filtering function to the input optical field and emits a filtered version of the input
5 field in an output direction and a method for making such a structure. The segmented
6 gratings fabricated in accordance with the present invention consist of a series of
7 spatially distinct subgratings arrayed end to end. Each subgrating possesses a periodic
8 array of diffraction structures (lines or more general elements). The overall transfer
9 function of the segmented grating is determined by controlling (a) the spatial periodicity
10 or frequency of each subgrating, (b) the amplitude of each subgrating, (c) the spacing
11 between the last diffraction structure (or line) on each subgrating and the first diffraction
12 structure (or line) of the successive subgrating, and (d) the optical path length and
13 transparency through each subgrating, or each subgrating plus additional material layers
14 utilized to control optical path length and transparency.

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